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A SYNOPSIS OF THE GENUS *MACROPHARYNX* (APOCYNACEAE)

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ABSTRACT. A synopsis of the genus *Macropharynx* is provided. *Macropharynx renteriae* is reported for the first time from Mesoamerica. A new combination, *M. steyermarkii* is proposed here.

Key Words: Apocynaceae, Apocynoideae, *Macropharynx*

Macropharynx is a neotropical genus of lianas with 5 species ranging from Costa Rica to northern Argentina. The genus was described by Rusby (1927), with a single species, *M. fistulosa.* Some years later Woodson (1931) found an older basionym for the same species and proposed a new combination, *M. spectabilis.*

Macropharynx is characterized by having eglandular leaves, subumbelliform to somewhat short-racemose, unbranched inflorescences, sepals with a solitary colleter, corolla tubes exappendiculate within and without a faucal annulus, nectaries longer than the ovary and as numerous as the sepals, and anther apices with attenuate to acute and indistinct auricles. According to Rusby (1927), Woodson (1933, 1936), and Pichón (1950), the most striking characteristic of *Macropharynx* is the presence of 7–13 sepals, an unusual condition in Apocynaceae. However, the eventual description of more species within the genus shows that this condition is restricted to *M. spectabilis* and occasionally to *M. renteriae,* which sometimes has flowers with six sepals. The variability of the number of sepals was pointed out by Woodson (1936) when he described *M. anomala,* a species which was included within *Macropharynx* in spite of the presence of only five sepals. In addition, Markgraf (1932) remarked that there is no clear demarcation between the sepals and the several bracts just below them in some species and he found that there is even a gradation in the presence of the characteristic episepalous colleter at the base of the bracts or sepals (e.g., *M. spectabilis*).

Recently, Morillo (1995) characterized *Macropharynx* as having an indefinite number of glands (nectaries) distributed within the calyx, as opposed to *Asketanthera steyermarkii* Markgraf

(here included in *Macropharynx*), which has only a solitary, episepalous gland per colleter. However, this characterization is erroneous because *Macropharynx* always has only one episepalous gland per colleter. In species such as *M. spectabilis* all the sepals share one colleter, but when lacerated, the colleter may be mistaken for many separate colleters. This is obvious in some genera such as *Prestonia* (Morales 1997), in which at anthesis, the colleters are generally entire or scarcely lacerate, but later exhibit many different kinds of laceration.

Macropharynx and *Asketanthera* Woodson are closely related within the Echiteae. These two genera can be distinguished using the following key:

1. Inflorescence bracts broadly ovate to broadly lanceolate-ovate, 1–2.5 cm long, 0.7–1.3 cm wide; anther auricles usually somewhat rounded or nearly so; nectaries shorter than the ovary; West Indies ..... *Asketanthera*
1. Inflorescence bracts linear, narrowly elliptic, elliptic to lanceolate, 0.5–1.6 cm long, 0.2–0.5 cm wide; anther auricles acute to short-acuminate; nectaries equalling or longer than the ovary; Costa Rica to Argentina ..... *Macropharynx*

Since the last treatment of *Macropharynx* (Woodson 1936), additional field and herbarium studies have increased the number of recognized species and altered our concept of the genus. In addition, while preparing the treatment of Apocynaceae for *Flora Mesoamericana,* the genus *Macropharynx* was reported for the first time from this area, increasing the range of distribution of the genus. This unacceptable situation seemed to warrant the synopsis presented here, which provides an up-to-date account of the genus.

A diagnostic key to the recognized species is presented here. In common species, only selected specimens are cited.

TAXONOMIC TREATMENT

Macropharynx Rusby, Mem. New York Bot. Gard. 7: 327, pl. 6. 1927. TYPE: *M. spectabilis* (Stadelmeyer) Woodson.

Suffruticose lianas. Stems usually terete to somewhat flattened, minutely ferrugineous-tomentulose, hispid to glabrate, inconspic-

uously to somewhat lenticellate, with milky sap or clear latex (even in the same species). Leaves opposite, membranaceous to firmly membranaceous, blade minutely puberulent, rarely sparsely strigillose or hispid, eglandular, petiole minutely appendiculate, slightly fused at the base, mostly glandular in the axils. Inflorescence a subumbellate cincinnus cyme, axillary, variously puberulent, (1) 3–16-flowered, short-pedunculate, bracts foliaceous to somewhat foliaceous, rarely scarious. Flowers: sepals 5–13, imbricate at the base, bearing a solitary episepalous colleter within, entire or minutely erose or denticulate; corolla infundibuliform or salverform, hispid, minutely puberulent to glabrous or glabrate without, tube exappendiculate within, the limb 5-parted, actinomorphic, dextrorsely convolute; stamens 5, included to somewhat exserted, infrastaminal indument within, anthers connivent and agglutinated to the pistil head, consisting of 2 parallel, uniformly fertile thecae borne adaxially near the apex of an enlarged, sagittate, 2-auriculate, peltate connective, auricles short, acute to short-acuminate, filaments short, puberulent to pilose; carpels 2, united at the apex by a common stylar shaft surmounted by the fusiform pistil head, ovules numerous, multiseriate; nectaries 5, distinct. Follicles 2, apocarpous, smooth, terete to subterete, thick or thin, dehiscing along the ventral suture, seeds numerous, dry, rostrate, comose, usually rugose.

Macropharynx comprises 5 species, ranging disjunctly from Costa Rica and Colombia to Bolivia and northern Argentina.

KEY TO THE SPECIES OF *MACROPHARYNX*

1. Sepals 7–13, linear to very narrowly elliptic .. 1. *M. spectabilis*
1. Sepals 5, rarely 6, narrowly lanceolate or elliptic to narrowly to broadly ovate ..... (2)
   2. Sepals broadly ovate; inflorescence racemose and somewhat elongate; Northern Argentina .... 2. *M. meyeri*
   2. Sepals narrowly lanceolate, narrowly elliptic to narrowly ovate; inflorescence subumbelliform, fasciculate or cymose, reduced and congested; Venezuela, Ecuador, Colombia, and Costa Rica ..... (3)
      3. Stems and leaf blades densely to sparsely hispid, indument yellowish ..... 3. *M. steyermarkii*
      3. Stems and leaf blades minutely ferrugineous-tomentulose to glabrate ..... (4)

4. Corolla salverform; tube 1.4–1.6 cm; lobes 0.9–1.2 cm ..... 4. *M. anomala*
4. Corolla subsalverform to very narrowly infundibuliform; tube 2.3–3 cm; lobes 2–2.4 cm .. 5. *M. renteriae*

1. **Macropharynx spectabilis** (Stadelmeyer) Woodson, Ann. Missouri Bot. Gard. 18: 552. 1931.

Echites spectabilis Stadelmeyer, Flora 24 (1), Beibl. 1 (3): 44. 1841. TYPE: BRAZIL. Amazonas: Río Negro et Río Solimoes in regione Japurensi, *Martius s.n.* (HOLOTYPE: M; ISOTYPE: B, destroyed; photographs, F, INB, MO, NY, US ex M).

Elytropus spectabilis (Stadelmeyer) Miers, Apoc. South Am. 116. 1878.

Macropharynx fistulosa Rusby, Mem. New York Bot. Gard. 7: 329. fig. 6. 1927. TYPE: BOLIVIA. Rurrenabaque, 30 Jan 1922, *White 3260* (HOLOTYPE: NY; ISOTYPE: MO).

Macropharynx strigillosa Woodson, Fieldiana, Bot. 28: 499. 1953. TYPE: BRAZIL. Pará: Belem, northeast woods of the I.A.N., 20 Oct 1942, *Archer 7770* (HOLOTYPE: MO; ISOTYPE: US).

Stem terete to subterete, densely hispid to minutely and densely ferrugineous-tomentulose, eventually becoming glabrate. Leaves: blade 8–33.5 cm long × 4.5–21 cm wide, membranaceous to subchartaceous, broadly ovate, elliptic-ovate to ovate, apex shortly and abruptly acuminate, base obtuse, rounded to somewhat cordate, the upper surface minutely ferrugineous-puberulent, becoming glabrate, lower surface minutely ferrugineous-pilosulous to glabrate (sometimes sparsely hispid on both surfaces), petiole 2.5–9 cm long, hispid, ferrugineous-tomentulose to glabrate. Inflorescence axillary, subumbellate to subumbellate-fasciculate, (1) 2–7 (10)-flowered, peduncle 0.3–0.7 (1.5) cm, pedicels 0.7–1.5 (2) cm, bracts 0.5–0.6 cm long, linear to very narrowly elliptic, conspicuous, scarious to somewhat foliaceous. Flowers: sepals 7–13, linear to very narrowly lanceolate to very narrowly elliptic, 0.8–1.4 cm, minutely puberulent to glabrate, slightly foliaceous, bearing 1 colleter within, minutely denticulate; corolla infundibuliform to subsalverform, greenish-white, glabrous to glabrate without, tube 2–5 cm, sometimes inflated at the insertion of the stamens, lobes 1.2–2.3 cm long, obliquely obovate; stamens inserted approximately in the middle of the corolla tube, anthers 9–10 mm, included, glabrous; ovary ca. 3 mm long, glabrous to glabrate, pistil head 1.5–2 mm long; nectaries 3–3.5 mm long, separate. Follicles 14–25 cm long × 1.3–1.8 cm wide, somewhat

falcate, ferrugineous-hispidulous to glabrous or glabrate, seeds 1.2–1.5 cm long, the coma 4.4–5 cm long, tannish-cream.

Macropharynx spectabilis occurs in wet forests of Colombia, Ecuador, Venezuela, Guyanas, Peru, Bolivia, and Brazil, from 50–1000 m, and is the most widely distributed species in the genus.

A good character to identify this species is the 7 to 13 linear sepals of the calyx. The only other species of *Macropharynx* with more than five sepals (occasionally) is *M. renteriae,* but it differs greatly in having wider sepals and bracts. The consistent presence of 7 to 13 sepals is an unusual condition in Apocynaceae. Among all the neotropical genera known to me, this characteristic is otherwise found in only one species of *Aspidosperma, A. darienensis* Woodson ex Dwyer, which has 6 to 7 sepals.

Macropharynx spectabilis exhibits great variation in the density of indument on the inflorescence and stems, and in the length and shape of the corolla, as was pointed out by Xifreda (1984). These characters are variable in other genera of Apocynaceae (e.g., *Prestonia, Mandevilla, Odontadenia*) and cannot be used to separate species (Morales 1996, 1997, 1998).

Only a selection of specimens examined is cited for each country, but a list of all the specimens examined is available on request.

REPRESENTATIVE SPECIMENS. **Colombia.** CAQUETÁ: Río Orteguaza, 25 Jan 1969, *Plowman et al. 2279* (MO, NY). VAUPÉS: Sorotama, Río Apaporis, entre el Río Pacoa y el Río Kananari, 15 Sep 1951, *Schultes et al. 13991* (COL [2 sheets], F, MO); above mouth of Río Kananari, Jan 1952, *Schultes et al. 19592* (COL, F, MO).

Ecuador. NAPO: near Lago Agrio, road to Baeza, 5 Aug 1974, *Plowman et al. 4086* (COL, UC).

Venezuela. BOLÍVAR: Caño Pablo, tributary of Río Caura, 10 May 1982, *Liesner et al. 14002* (MO); forested middle slopes near Río Tirica, 5 Mar 1955, *Steyermark et al. 1254* (NY); along Río Karuai of Sororopán Tepui, W of La Laja, 29 Nov 1944, *Steyermark 6077* (NY, MO).

Bolivia. BENI: Rurrenabaque, 1 Dec 1921, *Cárdenas 1894* (K, NY, US); Moxos, San Ignacio de Moxo, 12 Apr 1979, *Krapovickas et al. 34954* (CTES, MO, SI); Ballivian Province, road Caranavi-San Borja, Serranía del Pilón Lajas, 16 Feb 1990, *Smith et al. 13939* (INB, LPB, MO). LA PAZ: San Carlos, 21 Dec 1926, *Buchtien 1743* (NY); Larecaja, 24 Jan 1988, *Solomon 17688* (LPB, MO). SANTA CRUZ: Ichilo Province, 15 km SSE of Buena Vista, San Rafael de Amboro, 19 May 1991, *Gentry 74127* (INB, MO); Ichilo, Parque Nacional Amboro, 12 Dec 1989, *Nee 38099* (MO, NY); Lara, Río Surutu, 27 Dec 1924,

Steinbach 6813 (B, BA, K, MO); Buenavista, 23 Dec 1916, *Steinbach 3200* (MO, SI).

Peru. LORETO: Iquitos, 3–11 Aug 1929, *Killip & Smith 27102, 27493* (both MO, NY, US); Mishuyacu, near Iquitos, Oct 1929, *Klug 541* (NY, US); Río Nanay, 25 Feb 1976, *Revilla 237* (F, MO); Maynas, Río Ampiyacu, 19 Jul 1976, *Revilla 918* (F, MO); Maynas, Río Nanay, near Iquitos, 12 Apr 1978, *Rimachi 3545* (MO). SAN MARTÍN: Province Mariscal Cáceres, Río Sión, 2 Oct 1969, *Schunke 3457* (COL [2 sheets], F, MO, NY); Mariscal Cáceres, Tocache Nuevo, 20 Apr 1970, *Schunke 3950* (COL, F, MO); Tocache Nuevo, road to Pushurumbo, 2 Mar 1978, *Schunke 9969* (COL, F, MO, NY).

Brazil. AMAZONAS: Estrada de Petrobas, 17 Jun 1958, *Coelho 10* (MO); Manaus, Reserva Experimental do INPA, 3 Aug 1973, *Prance et al. 18724* (INPA, NY). PARÁ: Belem, 1 Jan 1926, *Ducke 21586* (B, RB, US); Santarem, km 70 da estrada do palhao, arredores do Acampamento do Igarape Guarana, 8 Nov 1969, *Silvia et al. 2517* (MG, NY).

2. **Macropharynx meyeri** (C. Ezcurra) Xifreda, Kurtziana 17: 164. 1984. *Temnademia meyeri* C. Ezcurra, Hickenia 1: 241. 1981. TYPE: ARGENTINA. Jujuy: Santa Bárbara, Sierra de Santa Bárbara, 1300 m, 15 Dec 1962, *de la Sota 2967* (HOLOTYPE: LP; photograph, INB ex LP).

Stem terete to subterete, minutely tomentulose to glabrate. Leaves: blade 7–15 (17.5) cm long × 5–11 (14.5) cm wide, membranaceous, ovate, apex acute, obtuse to short-acuminate, base broadly obtuse to rounded, the upper surface puberulent, lower surface densely and minutely tomentulose to puberulent, petiole 1.4–3.2 (3.6) cm long, puberulent. Inflorescence axillary, racemose, 6–11-flowered, peduncle 2.5–4 cm, pedicels 1.4–2.2 cm, bracts 0.8–1.3 cm long, lanceolate to narrowly elliptic, relatively conspicuous, somewhat foliaceous. Flowers: sepals 5, broadly ovate, 0.8–1.2 cm, foliaceous, minutely puberulent, bearing 1 colleter within, minutely lacerate; corolla salverform, reddish or yellowish to lilac, minutely puberulent without, tube 0.8–1 cm, 0.2–0.3 cm in diameter, not inflated at point of stamen insertion, lobes 0.5–0.6 cm long, narrowly obliquely ovate; stamens inserted near the mouth of the corolla tube, anthers 5–6 mm, somewhat exserted, glabrous to glabrate; ovary ca. 2 mm long, glabrous, pistil head ca. 2 mm long; nectaries ca. 2.5 mm long, separate. Follicles and seeds unknown.

This species occurs in northern Argentina, where it grows in premontane wet forests from 1300 to 1600 m, but probably will be found in Bolivia as well.

Macropharynx meyeri could be confused with *M. anomala,*

which is endemic to western Ecuador, but the latter species has a subumbelliform, somewhat congested inflorescence, and a longer corolla tube. Vegetatively this species is similar to *Prestonia riedelii* (Müller Argoviensis) Markgraf, but is easily distinguished by the exappendiculate corolla tube (without callus ridges) and the absence of a faucal annulus.

REPRESENTATIVE SPECIMENS. **Argentina.** JUJUY: Valle Grande, road Valle Grande to San Francisco, *Villa et al. 758* (LIL); Santa Bárbara, Sierra de Santa Bárbara, El Tipal, *Fabris 8077* (LP). SALTA: Santa Victoria, road to Los Toldos, ca. 12 km N of Lipeo, *Legname et al. 10030* (LIL, xerox INB ex LIL).

3. **Macropharynx steyermarkii** (Markgraf) J. F. Morales, *comb. nov.* Basionym: *Asketanthera steyermarkii* Markgraf, Acta. Bot. Venez. 5: 65–66. 1975. TYPE: VENEZUELA. Falcón: Sierra de San Luis, montaña de Paraguariba, 1400 m, 23 May 1979, *Steyermark 99348* (HOLOTYPE: Z; ISOTYPES: MO, VEN; photograph, INB ex MO).

Stem terete, densely to sparsely hispid. Leaves: blade 9.5–14 cm long × 5–8.5 cm wide, coriaceous, ovate, apex acuminate to acute, base rounded to somewhat cordate, the upper surface strigillose, lower surface hispid, petiole 0.9–1.4 cm long, hirsute. Inflorescence axillary, subumbellate-fasciculate, 3–7-flowered, peduncle 0.1–0.2 cm, pedicels 0.7–1.1 cm, bracts 0.6–0.7 cm long, narrowly elliptic, slightly subfoliaceous to scarious, inconspicuous. Flowers: sepals 5, narrowly lanceolate-ovate to narrowly elliptic, 1.1–1.3 cm, somewhat foliaceous, hispid, bearing 1 colleter within, minutely denticulate; corolla salverform to subsalverform, olive-green to yellowish-green, hispid, tube 1.8–2.2 cm, ca. 0.3 cm in diameter, lobes 0.9–1.2 cm long, obliquely ovate; stamens inserted near the base of the corolla tube, included, anthers 7–8 mm, included, glabrous; ovary 1–1.5 mm long, glabrous, pistil head 1.5–2 mm long; nectaries 1–1.5 mm long, separate. Follicles 15–18 cm long × 1.5–2 cm wide, somewhat falcate, hispid, seeds unknown.

Macropharynx steyermarkii occurs in premontane wet forests from 1000 to 1600 m in Venezuela, in the Falcón and Yaracuy states. It is known only from a few collections.

This species was originally described within *Asketanthera,* but following Pichón (1950), it must be transferred to *Macropharynx.* Characters suggesting its inclusion in *Macropharynx* are disk

glands longer than the ovary, anther apices with attenuate to acute auricles and the ovules in series of 10 in each carpel. In *Asketanthera* the disk glands are shorter than the ovary, anther auricles are somewhat rounded and the bracts of the inflorescence are foliaceous and well developed. In addition, *Asketanthera* is restricted to the West Indies.

Despite the fact that Woodson (1936) and Pichón (1950) characterized *Macropharynx* as having more than six sepals, five sepals occur in other species of the genus (*M. anomala, M. meyeri*).

REPRESENTATIVE SPECIMENS. **Venezuela.** FALCÓN: Sierra de San Luis, montaña de Paraguaribo, 23 May 1979, *F. Falcón 675* (MO, VEN); Cerro Socopo, 29 Jun 1979, *Liesner et al. 8411* (MO, U). YARACUY: Sierra de Aroa, Cerro Tigre, 3 Apr 1980, *Liesner et al. 9983* (MO).

4. **Macropharynx anomala** Woodson, Ann. Missouri Bot. Gard. 21: 614. 1934. TYPE: ECUADOR. Pilatón, Oct 1902, *Sodiro 107/16* (HOLOTYPE: B, destroyed; photographs, INB, MO ex B); *Dodson & Gentry 9704* (NEOTYPE: designated here, MO!; ISONEOTYPE: SEL!).

Stem subterete, minutely and densely ferrugineous-tomentulose to glabrate. Leaves: blade 9.5–21 cm long × 4.5–10 cm wide, membranaceous, broadly ovate to ovate, apex short-acuminate, base broadly obtuse to rounded, sometimes somewhat cordate, the upper surface ferrugineous-puberulent, lower surface densely and minutely ferrugineous-tomentulose, petiole 2–3.2 cm long, ferrugineous-tomentulose. Inflorescence axillary, subumbellate-fasciculate to subumbellate, 3–7-flowered, peduncle 1.5–2.9 cm, pedicels 1.3–2 cm, bracts 1–1.6 cm long, linear to very narrowly elliptic, relatively conspicuous, somewhat foliaceous. Flowers: sepals 5, narrowly lanceolate to narrowly elliptic, 1.6–1.9 cm, somewhat foliaceous, minutely puberulent, bearing 1 colleter within, entire to minutely denticulate; corolla salverform, white-cream, minutely puberulent without, tube 1.3–1.7 cm, ca. 0.2 cm in diameter, somewhat inflated at the insertion of the stamens, lobes 0.9–1.2 cm long, narrowly ovate; stamens inserted near the base of the corolla tube, anthers 7–8 mm, included, glabrous to glabrate; ovary 1.5–2 mm long, glabrous, pistil head 1.5–2 mm long; nectaries 1.5–2.5 mm long, somewhat separate. Follicles 32–36 cm long × 0.8–1.3 cm wide, linear, finely and glabrescently rufous-tomentose, seeds unknown.

This species occurs in western Ecuador, where it grows in wet forests from 1000 to 1400 m. Until recent collections, it was known only from the type at the Berlin Herbarium (B), which was destroyed during World War II.

The diagnostic characteristics of this species are the small, salverform corolla, the narrowly elliptic to narrowly lanceolate sepals, and the subumbelliform inflorescence. It resembles *Macropharynx meyeri,* from northern Argentina, but the latter species is easily distinguished by its racemose inflorescences.

I chose *Dodson & Gentry 9704* as the neotype because, of the two collections known to me of this species, it represents the most complete specimen, with both flowers and fruits.

REPRESENTATIVE SPECIMEN. **Ecuador.** PASTAZA: road between Baños and Mera, 8 Mar 1985, *Neill et al. 6164* (MO, USF).

5. **Macropharynx renteriae** A. H. Gentry, Phytologia 47: 99. 1980. TYPE: COLOMBIA. Chocó: ca. 37 km W of Las Animas on new Panamerican Highway, 180 m, 10 Jan 1979, *Gentry & Rentería 23955* (HOLOTYPE: COL; ISOTYPES: HUA, INB, MO, NY; photograph, INB ex MO).

Stem terete to subterete, minutely and densely ferrugineous-tomentulose to glabrate. Leaves: blade 11–30 cm long × 6–22.5 cm wide, membranaceous, broadly elliptic, ovate-elliptic to ovate, apex acute to acuminate, base obtuse, rounded to somewhat cordate, the upper surface glabrous to glabrate, lower surface sparsely to moderately and minutely ferrugineous-tomentulose, petiole 3–8.5 cm long, ferrugineous-tomentulose. Inflorescence axillary, subumbellate to subumbellate-fasciculate, (1)2–8 (16)-flowered, peduncle 0.3–0.7 cm, pedicels 0.9–2 cm, bracts 1–1.6 cm long, elliptic to narrowly elliptic, relatively conspicuous, somewhat foliaceous. Flowers: sepals 5–6, narrowly lanceolate to narrowly elliptic, 1.1–2.1 cm, somewhat foliaceous, minutely puberulent to glabrate, bearing 1 colleter within, minutely denticulate; corolla subsalverform to very narrowly infundibuliform, white to white-cream, the tube yellow within, minutely puberulent to glabrate without, tube 2.3–3 cm, 0.3–0.4 cm in diameter, inflated at the insertion of the stamens, lobes 2–2.4 cm long, obliquely obovate; stamens inserted approximately in the middle of the corolla tube, anthers 7–8 mm, included, pubescent dorsally to glabrate; ovary ca. 2 mm long, glabrous, pistil head 1.5–2 mm long; nectaries 2–

3 mm long, separate. Follicles 40–46 cm long × 0.7–1 cm wide, linear, densely and minutely ferrugineous-tomentulose, seeds 0.7–0.9 cm long, the coma 3.3–4.8 cm long, tannish to tannish-cream.

This species is known from wet forests and premontane forests in Costa Rica, Colombia, and Ecuador at 300 to 1000 m. Until recent collections from Costa Rica and Ecuador, *Macropharynx renteriae* was known only by the Colombian type collection. This is the first species of *Macropharynx* reported from Mesoamerica. Despite its disjunct status and the few collections available, in Costa Rica *M. renteriae* is a common liana in some parts of the Cordillera de Guanacaste and the Cordillera de Tilarán. The fruits and seeds are described here for the first time.

REPRESENTATIVE SPECIMENS. **Costa Rica.** ALAJUELA: Reserva Biológica Alberto Manuel Brenes, 24 Apr 1993, *Gómez-L. et al. 12422* (USJ); Reserva San Ramón, 1 Apr 1994, *Gómez-L. et al. 12638* (USJ); Upala, Bijagua, 15 Nov 1987, *Herrera 1288* (F, INB, MO). GUANACASTE: Parque Nacional Guanacaste, Pitilla, 15 Jun 1989, *Hammel et al. 17476* (INB, MO); Santa Cecilia, 20 Aug 1993, *Ramírez 58* (INB, MO); Parque Nacional Guanacaste, Fila Orosilito, 2 Mar 1991, *Ríos 326* (CR, INB, MO). LIMÓN: Parque Nacional Braulio Carrillo, Estación Carrillo, 25 Apr 1986, *Chacón 1847* (CR, INB).

Ecuador. ESMERALDAS: Quinindé, NE of Las Golondrinas, La Bella Jungla, Cooperativa La Bella Jungla, 10 Oct 1993, *Palacios 11514* (INB, MO, QCNE).

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